

## REDISCOVERY OF LIVE *GIBBULA NIVOSA* (GASTROPODA: TROCHIDAE)

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### Abstract

Live animals of the trochid gastropod *Gibbula nivosa*, which is endemic to the Maltese Islands, have not been recorded for over 25 years despite recent intensive searches in localities where good populations used to be found. Sampling carried out at Marsamxett Harbour and Comino has yielded live individuals from accumulations of cobbles and pebbles, showing that this is an important habitat for *G. nivosa* and confirming that this species is not extinct, although it should still be regarded as 'critically endangered'.

**Keywords:** Biodiversity, Conservation, Endemism, Gastropods, Mollusca

### Introduction

The Maltese Topshell *Gibbula nivosa* is a critically endangered [1] trochid gastropod endemic to the Maltese Islands [2,3]. Although this species has been reported many times from Malta, it is rare and the last record of live individuals dates back to 1981 [4] despite recent intensive searches for the species in many localities [1]. Given its restricted geographical distribution and rarity, *G. nivosa* is protected under both local and international legislation. Proper conservation and management of this species is necessary to safeguard it but very limited information on its current status exists, a situation that can only be addressed by intensive sampling of the coastline where reported habitats of *G. nivosa* occur. The main habitat for the species is regarded to be leaves of the seagrass *Posidonia oceanica* at depths down to 10m [5], but the gastropod has also been reported from under stones in shallow water [4,6] and fresh empty shells were recently (2006) collected from such a habitat in Marsamxett Harbour, suggesting that live individuals may have been present.

### Material and Methods

Surveys of the infralittoral cobble beds in Marsamxett Harbour (Fig. 1) were made in September 2006 and December 2007. Stations were established along the long axis of the cobble beds and three replicate samples were randomly collected from each station at depths of 5-12m, using a 0.1m<sup>2</sup> circular quadrat. The cobbles and pebbles within the quadrat were carefully handpicked and transferred to a 0.5mm mesh-bag, whilst a small hand net was used to scoop the basal layer of finer granules into a separate mesh-bag. In the laboratory, the sediment was sorted by hand, and the collected molluscs were identified and counted. Any *G. nivosa* found were kept alive and returned to their original site of collection. Searches for this species were subsequently carried out at sites in Comino, Qawra Point and St. Thomas Bay, where similar infralittoral cobble and pebble beds occur.

### Results and Discussion

Live individuals of *G. nivosa* were collected during both surveys at Marsamxett, with mean abundances of 37.3±78.6SD and 17.6±25.0SD individuals/m<sup>2</sup> recorded in September 2006 and December 2007, respectively. The large variation in abundance, reflected by the high standard deviation, was probably due to the patchy distribution of the species within its habitat, which had a low cover (ca 0.005km<sup>2</sup> only) within the area. The relatively restricted habitat area would support a small total population of *G. nivosa*. The habitat at Marsamxett was characterised by a gently sloping bottom of gravelly sand and silt with overlying accumulations of cobbles and pebbles (modal size: 16-64mm diameter; maximum thickness of pebble layer: 10cm) (Fig.1). This vertical stratification enabled the two layers to be sampled separately, and significantly higher densities of *G. nivosa* were recorded from the upper pebble stratum than from the gravelly sand below (Mann-Whitney U-test,  $p = 0.018$ ). Two live individuals were collected whilst searching at Comino on a similar bottom type, albeit with a much sparser cover of cobbles and pebbles, at a depth of 18-20m. However, no live animals were found at the other two sites, where the cobbles and pebbles occurred interspersed with *P. oceanica* beds. It is interesting to note that one of these sites, St Thomas Bay, has been regarded as the main locality for *G. nivosa* [4,6].

The present record is the first of live individuals of *G. nivosa* in over 25 years, showing that this species is not extinct and suggesting that other as yet undiscovered populations may exist in some places. Although the main habitat of *G. nivosa* is considered to be *P. oceanica* leaves, in this study live animals have been recorded from infralittoral cobbles and pebbles within Marsamxett Harbour, where the seagrass is not present, indicating that cobble beds may be a more important habitat for *G. nivosa* than previously thought. It is possible that individuals collected from seagrass leaves in the past were only foraging there and actually retreated to the accumulations of cobbles and pebbles

(assuming this habitat was interspersed with seagrass beds) when not feeding. However, during this study, no *G. nivosa* were found in either accumulations of cobbles and pebbles interspersed with seagrass beds, or on the *Posidonia* leaves, so more work is required to test this hypothesis. Searches in cobble habitats are necessary for a better knowledge of the current status of *G. nivosa*, which is still regarded as 'critically endangered' under the 2001 IUCN Red List criteria [7].

**Acknowledgements:** This research work was partly funded through a Malta Government Scholarship Scheme grant (ME 367/07/35) awarded to JE.

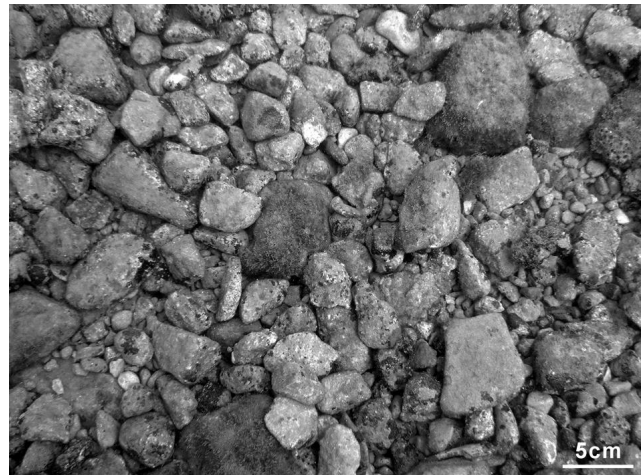


Fig. 1. Infralittoral cobbles and pebbles at depths of 5-12m in Marsamxett Harbour, Malta, where *Gibbula nivosa* was found (photo: M. Sciberras)

### References

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